Device Modeling Report

COMPONENTS: Insulated Gate Bipolar Transistor (IGBT)
PART NUMBER: 1MB10D-120
MANUFACTURER: FUJI ELECTRIC
* REMARK: Free-Wheeling Diode Special Model

Bee Technologies Inc.

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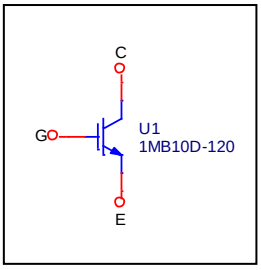
Circuit Configuration



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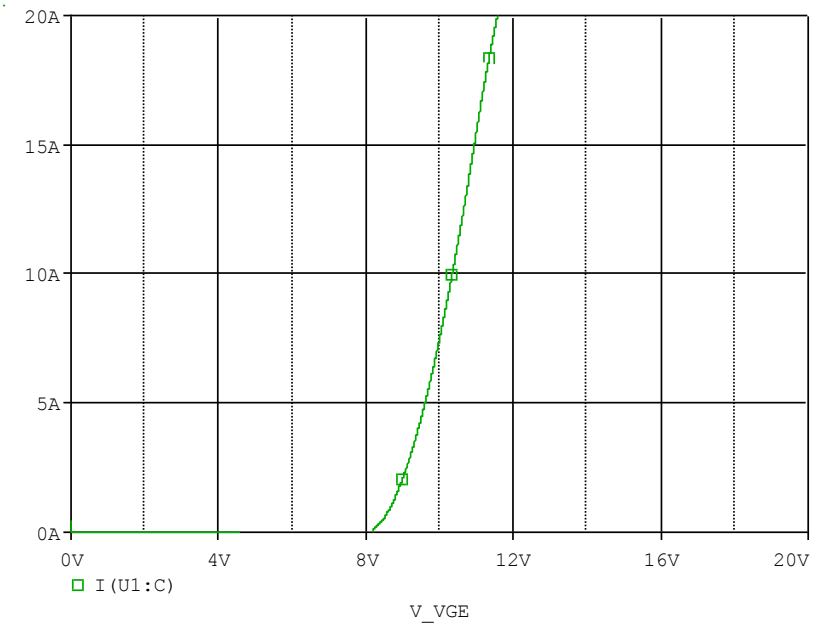
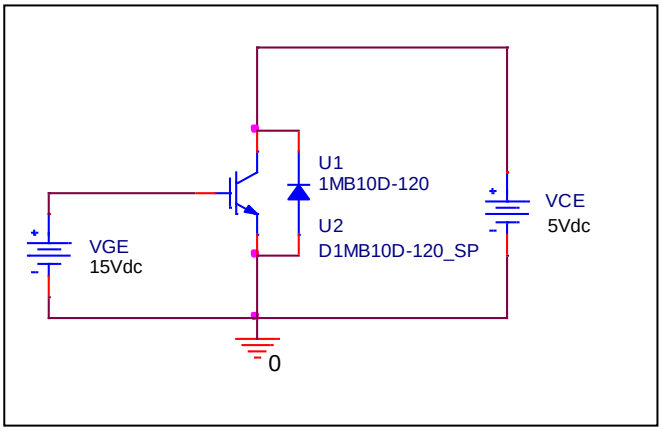
Transfer Characteristics

Circuit Simulation result



Evaluation circuit



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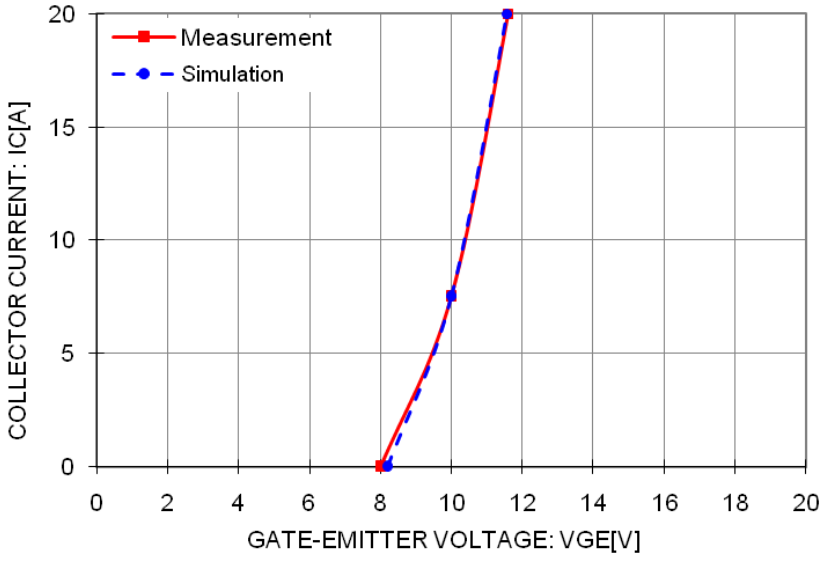
Comparison Graph

Simulation result



Comparison table

Test condition: V_{CE} =5 (V)

IC (A)	VGE (V)		%Error
	Measurement	Simulation	
0.000	8.000	8.194	2.43
7.500	10.000	10.000	0.00
20.000	11.600	11.567	-0.28

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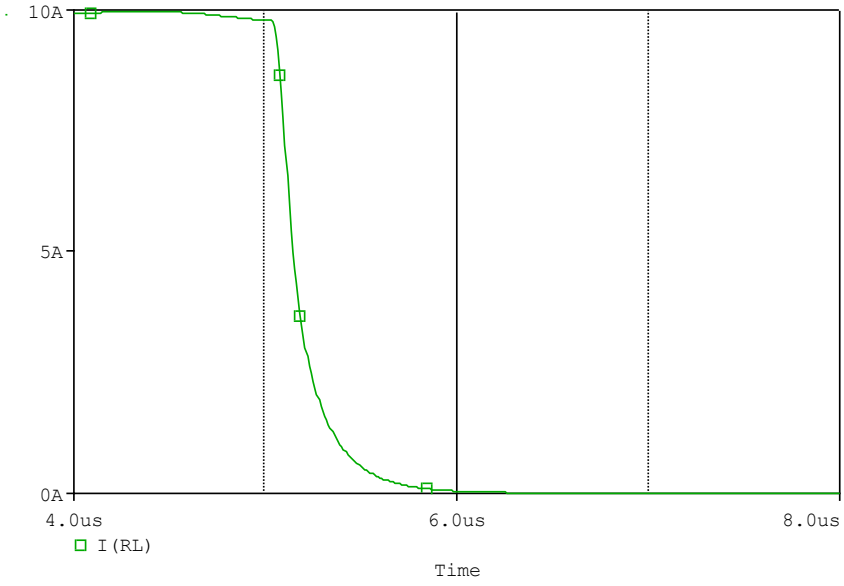
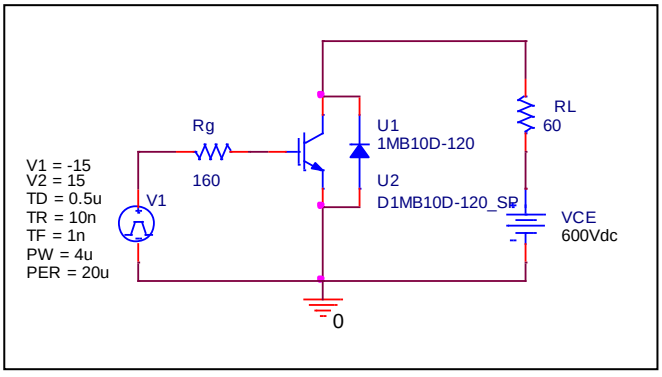
Fall Time Characteristics

Circuit Simulation result



Evaluation circuit



Test condition: I_C=10 (A), V_{CC}=600 (V)

Parameter	Unit	Measurement	Simulation	%Error
tf	us	0.320	0.323	0.94

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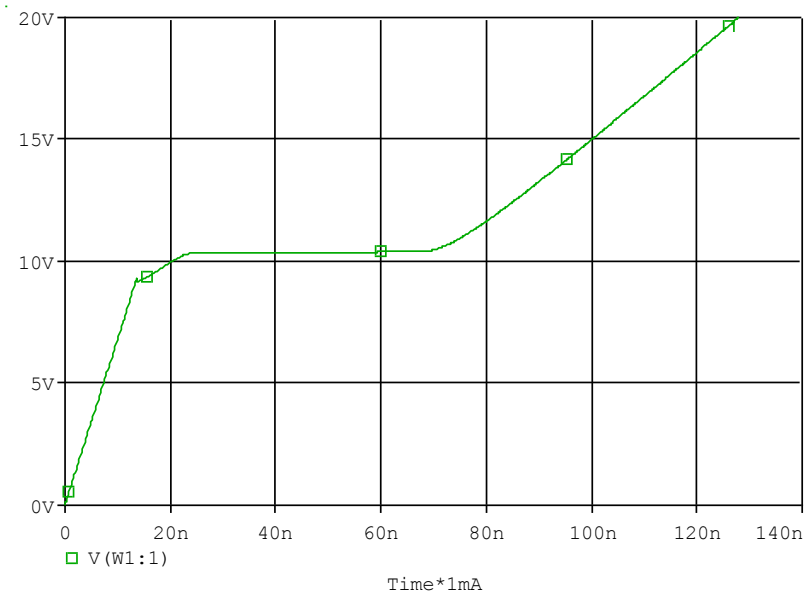
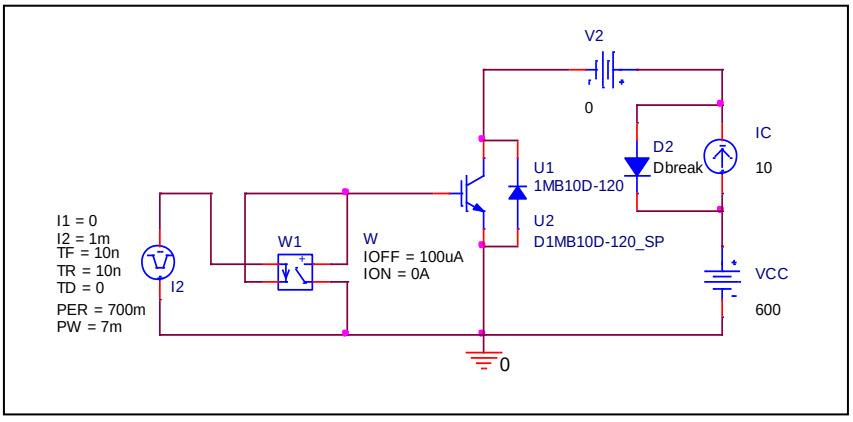
Gate Charge Characteristics

Circuit Simulation result



Evaluation circuit



Test condition: V_{CC}=600 (V), I_C=10 (A), V_{GE}=15 (V)

Parameter	Unit	Measurement	Simulation	%Error
Qge	nc	18.000	18.293	1.63
Qgc	nc	53.000	51.707	-2.44
Qg	nc	100.000	100.006	0.01

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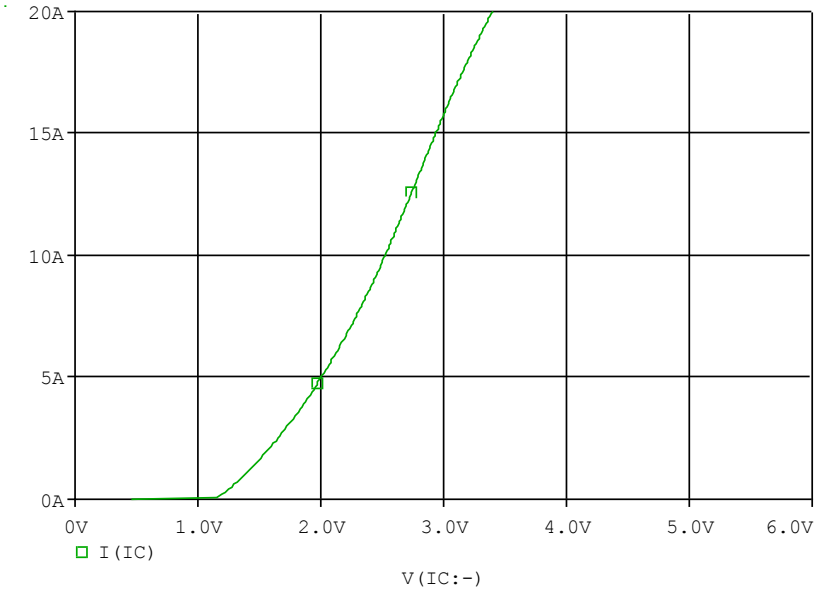
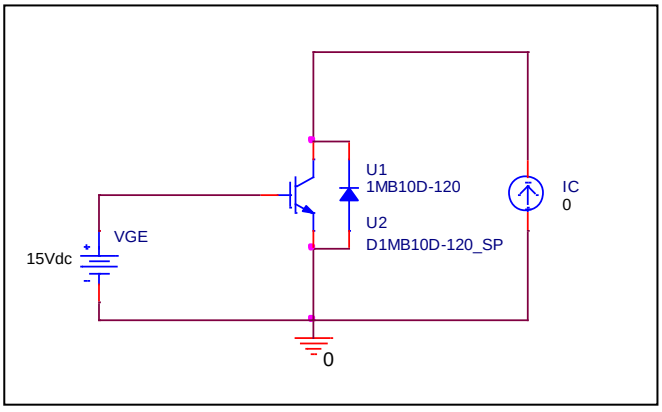
Saturation Characteristics

Circuit Simulation result



Evaluation circuit



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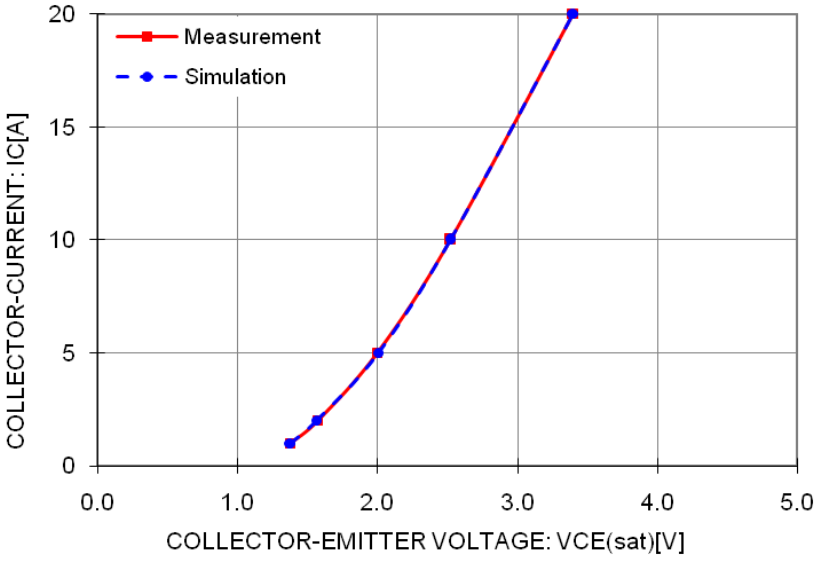
Comparison Graph

Simulation result



Comparison table

Test condition: V_{GE} =15 (V)

IC (A)	VCE (V)		%Error
	Measurement	Simulation	
1	1.375	1.381	0.44
2	1.575	1.566	-0.60
5	2.000	2.005	0.23
10	2.525	2.524	-0.04
20	3.400	3.400	0.00

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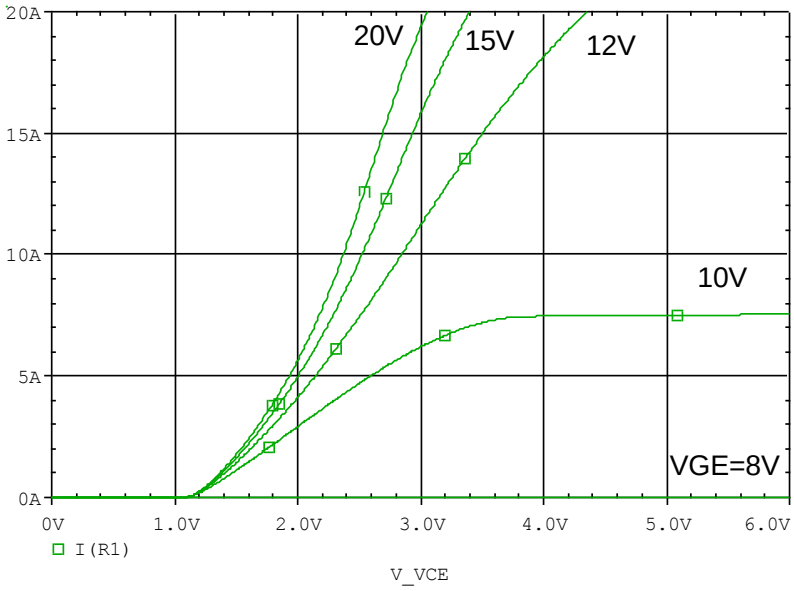
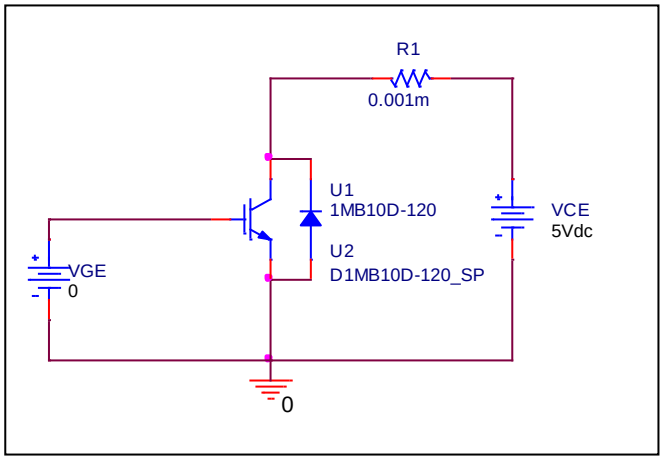
Output Characteristics

Circuit Simulation result



Evaluation circuit



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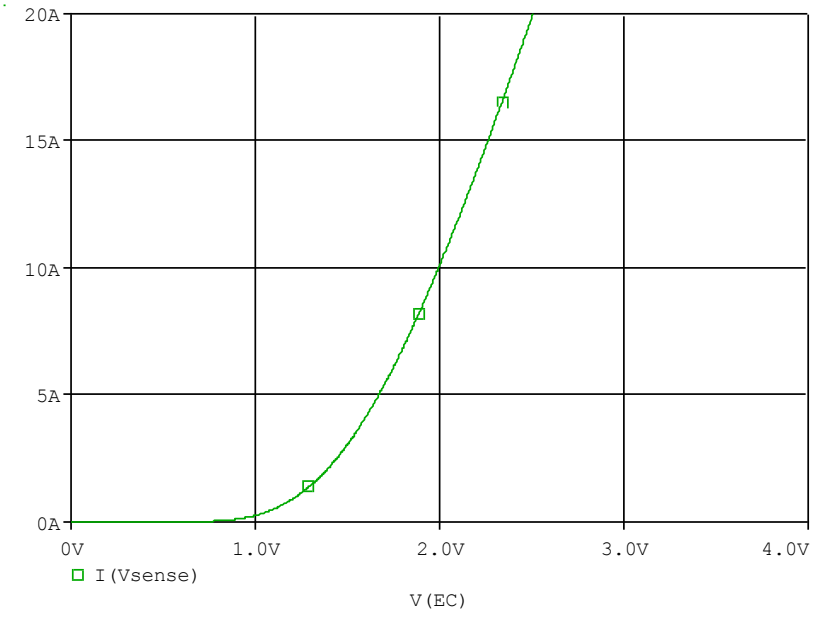
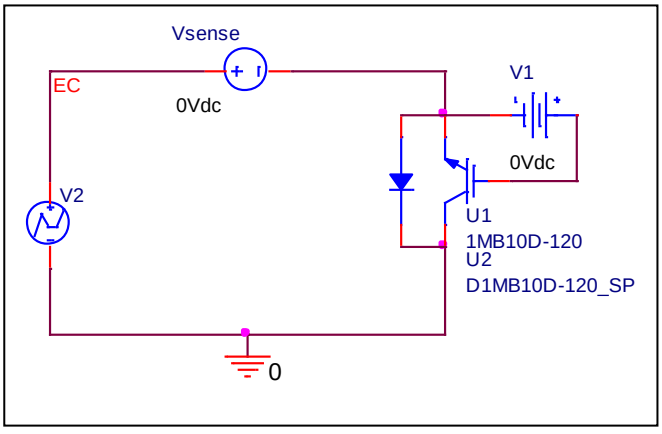
FWD Forward Current Characteristics

Circuit Simulation result



Evaluation circuit



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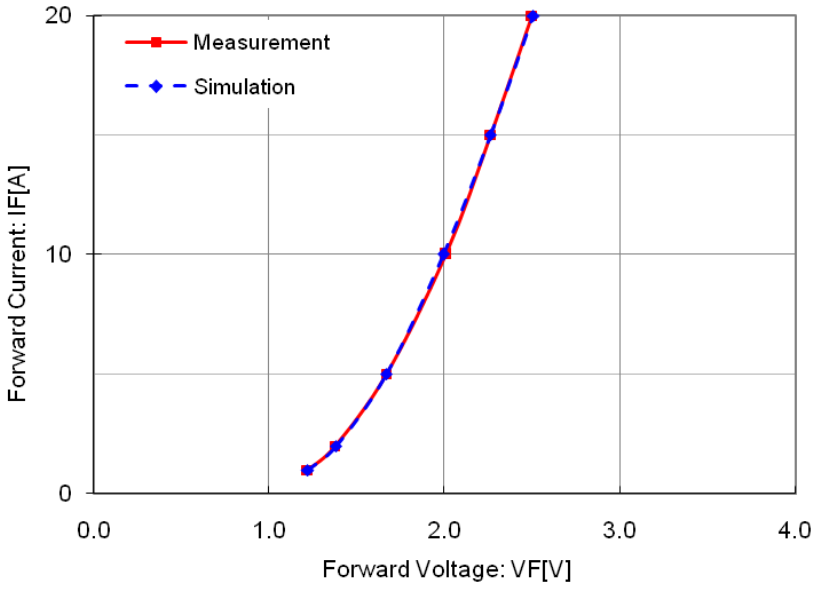
Comparison Graph

Simulation result



Comparison table

IF(A)	VF (V)		%Error
	Measurement	Simulation	
1	1.220	1.221	0.07
2	1.375	1.381	0.41
5	1.670	1.669	-0.05
10	2.010	1.993	-0.83
15	2.265	2.262	-0.13
20	2.500	2.507	0.27

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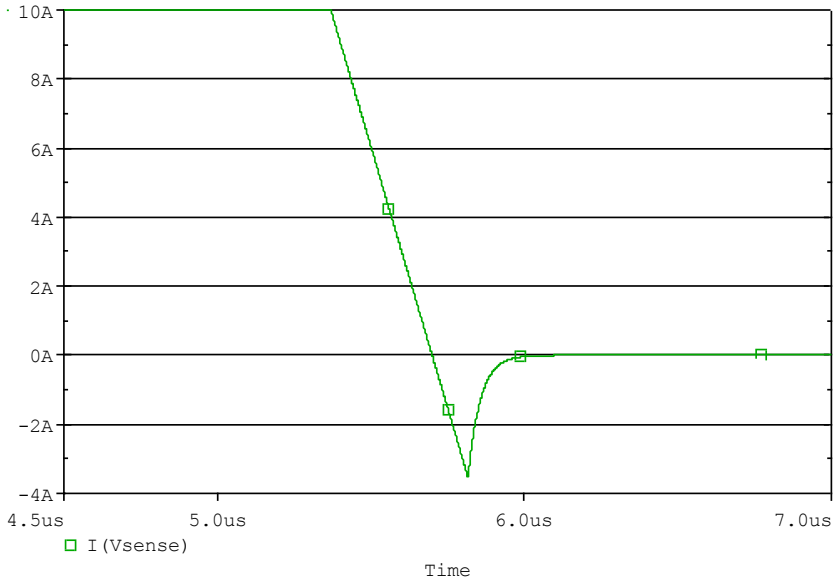
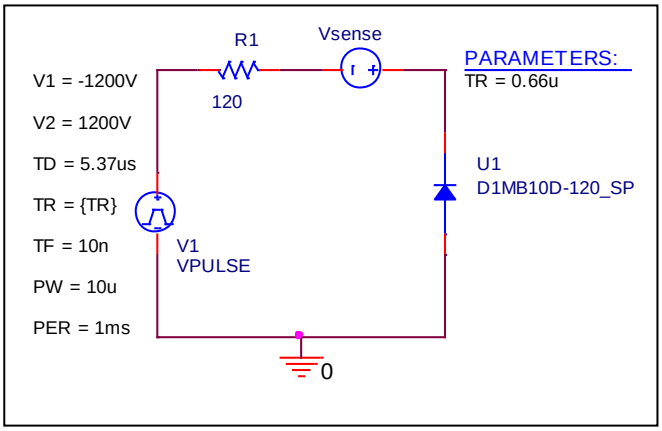
Reverse Recovery Characteristics

Circuit Simulation result



Evaluation circuit



Test condition: VCC=1200 (V), IC=10 (A), -di/dt=30 (A/us)

Parameter	Unit	Measurement	Simulation	%Error
trr	nsec	210.000	209.564	-0.21
Irr	A	3.500	3.520	0.57

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